

Section C - Environmental Surveillance

Hazardous Substances Emergency Events Surveillance (HSEES)

A total of 300* events meeting the Hazardous Substances Emergency Events Surveillance (HSEES) case definition were reported during calendar year 2004. Events occurred in 73 counties including the City of St. Louis (**Figure 11C**). Of the 300 events, one was a threatened release and the remaining were actual releases. Of all reported events, 148 (49%) occurred at fixed facilities and 152 (51%) were transportation-related. The most common fixed-facility events in which only one area was involved were indoor, non-industrial, living (residence) areas (35, 24%); indoor, non-industrial, non-living areas (31, 21%) and storage areas above ground (26, 18%). Two (1%) fixed-facility events involved more than one affected area. The most common transportation events (144, 95%) occurred during ground transport (e.g., tanker truck, non-tanker truck, van, or automobile) and eight (5%) involved transport by rail.

Methamphetamine-related activities contributed to the total number of events reported with 64 (21%) events resulting from methamphetamine production (**Figure 12C**).

CONTRIBUTING FACTORS

Data regarding primary and secondary factors contributing to events were collected on all 300 events. Human error was the primary factor in 192 (64%) of the events; of which 29 (15%) were due to responders not having the appropriate Personal Protective Equipment (PPE) when entering a methamphetamine lab.

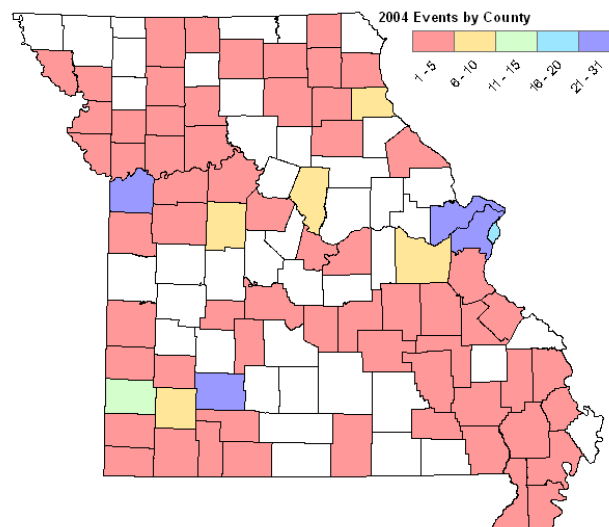


Figure 11C—Geographic distribution of events by county, Hazardous Substances Emergency Events Surveillance, Missouri, 2004

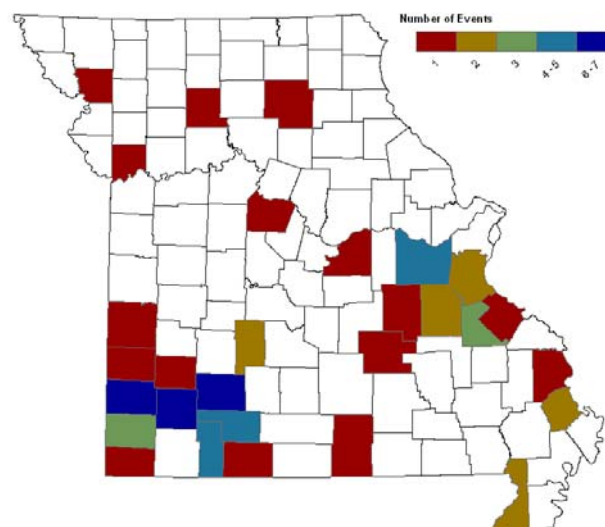


Figure 12C—Distribution of methamphetamine events by county, Hazardous Substances Emergency Events Surveillance, Missouri, 2004.

*All data is preliminary, subject to change

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Hazardous Substances Emergency Events Surveillance (continued)

Equipment failure was the primary factor in 51 (17%) events. The primary factor was not known for 12 events (4%). Intentional or illegal act was the primary factor for 40 (13%) events.

CHEMICALS RELEASED

During 2004, there were a total of 404 substances involved in the 300 events. Of those, there were 403 substances that were actually released during 299 HSEES events. Fixed-facility events involved the release of 229 substances, and transportation-related events involved the release of 174 substances. The 10 substances most frequently released in Missouri for calendar year 2004 were Ammonia, Hydrochloric Acid, Acetone, Sodium Hydroxide, Sulfuric Acid, Proteat, Mercury, Ethyl Ether, Methamphetamine Chemicals Not Otherwise Specified (NOS) and Phosphorus (**Table 2C**).

Of the 16 categories into which HSEES substances were grouped, the categories of substances most commonly released in fixed-facility events were other inorganic substances (54, 24%), acids (38, 17%) and volatile organic compounds (37, 16%). In transportation-related events the most frequently released chemicals were categorized as volatile organic compounds (35, 20%), other inorganic substances (25, 14%) and acids (25, 14%).

The substances most frequently released may not necessarily be the most likely to result in victims (**Table 3C**). For example, ammonia was released during 43 events; however, only 19 of these events (44%) resulted in adverse health effects. Conversely, bases were released in only 29 events, and 18 of these events (62%) resulted in adverse health effects, indicating its greater potential for immediate harm.

Table 2C—10 most frequently released substances, Hazardous Substances Emergency Events Surveillance, Missouri, 2004.

Number	Standardized Substance Name	Frequency
1.	Ammonia	43
2.	Hydrochloric Acid	26
3.	Mercury	23
4.	Acetone	20
5.	Sulfuric Acid	19
6.	Phosphorus	19
7.	Sodium Hydroxide	15
8.	Methamphetamine Chemicals NOS*	13
9.	Ethyl Ether	11
10.	Proteat	10
	Total	199
	*Not Otherwise Specified	



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Hazardous Substances Emergency Events Surveillance (continued)

Table 3C—Number of substances released in all events and events with victims, by substance category, Hazardous Substances Emergency Events Surveillance, Missouri, 2004.

Substance category	Total Releases		Releases with Victims		
	No.	Percentage of total releases	No.	Percentage of all releases with victims	Percentage of releases in substance category
Acids	63	16%	39	20%	62%
Ammonia	43	11%	19	10%	44%
Bases	29	7%	18	9%	62%
Chlorine	9	2%	1	1%	11%
Other inorganic substances	79	20%	44	22%	56%
Paints & dyes	9	2%	0	0%	0%
Pesticides	15	4%	2	1%	13%
Polychlorinated biphenyls	2	0.50%	0	0%	0%
Volatile organic compounds	72	18%	43	22%	60%
Other, not otherwise specified	30	7%	22	11%	73%
Mixture	20	5%	6	3%	30%
Formulations	1	0.30%	0	0%	0%
Hetero-Organics	1	0.30%	0	0%	0%
Hydrocarbons	2	0.50%	1	1%	50%
Oxy-Organics	16	4%	2	1%	13%
Polymers	12	3%	1	1%	8%
Total *	403	**100.6%	198	**102%	-

*Total exceeds number of events because events in which more than one substance was released were counted more than once.

**Percentage does not equal 100% due to rounding.

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Hazardous Substances Emergency Events Surveillance (continued)

VICTIMS

A total of 145 victims were involved in 95 events (32% of all events). Of the 95 events, 70 events occurred in a fixed facility. Of the events with victims, 73 (50%) involved only one victim and 12 (8%) involved two victims. Three events (2%) involved five or more victims. Of the total number of victims, 110 (76%) were injured during fixed-facility events. For transportation events, 35 people (24%) sustained adverse health outcomes.

The population groups most often adversely affected were police officers (77, 53%) and employees (50, 34%). However, the general public (17, 12%) and hospital personnel (1, 0.7%) were also affected. There were 54 first responder victims in fixed-facility events and 23 first responder victims in transportation-related events. Of the 77 first responder victims, (69, 90%) were police officers injured during methamphetamine-related events (**Figure 13C**).

The 145 victims sustained a total of 207 adverse health effects. The most commonly reported adverse health effects were respiratory irritation (67, 32%), headache (62, 32%) and dizziness or other central nervous system symptoms (17, 8%). Other reported adverse health effects (61, 29%) were burns (chemical-related, not chemical-related or both), symptoms from carbon monoxide, chemical poisoning, eye irritation, gastrointestinal problems, heat stress, high blood pressure, skin irritation, trauma (chemical-related, not chemical-related or both).

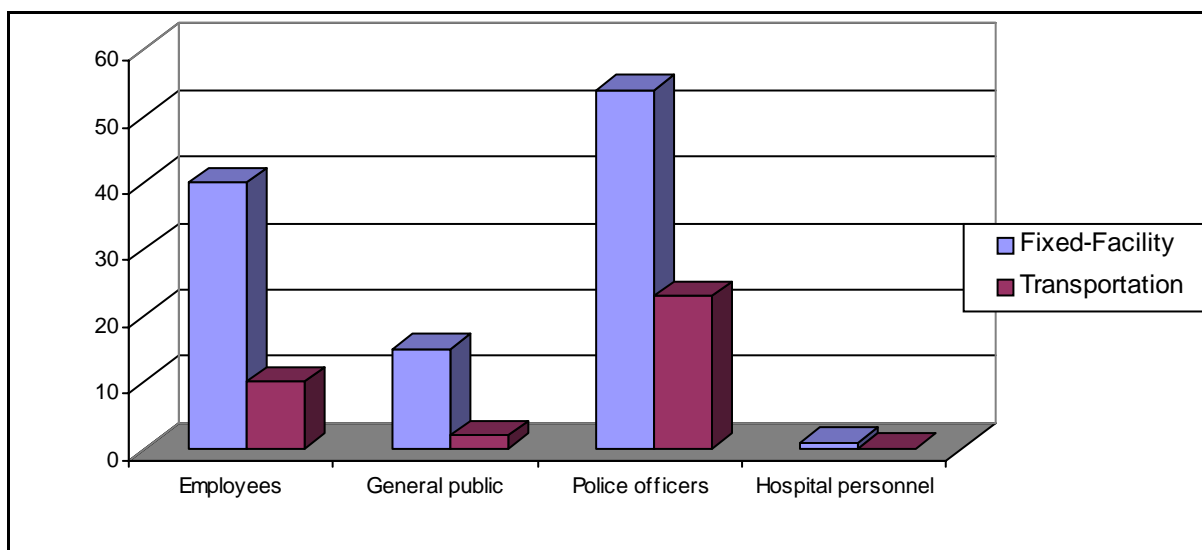


Figure 13C—Distribution of victims by population group and type of event, Hazardous Substances Emergency Events Surveillance, Missouri, 2004



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Hazardous Substances Emergency Events Surveillance (continued)

Of the 143 victims for who the status of disposition was known, a total of 60 victims (42%) were treated at a hospital but were not admitted; 8 (6%) were treated at a hospital and admitted. Injuries for 70 victims (49%) were reported by an official within 24 hours of the event. The majority of these injuries were self-reported by law enforcement officers responding to and/or collecting evidence from clandestine methamphetamine labs.

Of the two deaths reported in the HSEES system in 2004, both were related to methamphetamine production. In one incident, a man was killed and a woman was critically injured when a tank of anhydrous ammonia exploded in the rear of the vehicle during transportation. The remaining fatality involved a house fire, due to a methamphetamine lab, that killed a man in the house.

EVACUATIONS

Evacuations were ordered in 21 events (7%). The number of persons evacuated was known for 16 of the 21 events and the median number of persons evacuated was 9 (range: 1 - 600). The length of evacuation was known for 13 of the 21 events and the median length of evacuation was 3.3 hours (range: 1 - 12 hrs).

Evacuations were ordered in 2 of the 21 events as a result from methamphetamine-related activity. The number of people evacuated was known in one of the two events; in which 4 people were evacuated in this event. One of the events involving an evacuation involved an active residential methamphetamine lab and the other was caused by the theft of anhydrous ammonia.

For additional reports, data analyses and information on the Missouri HSEES program please view our web site at www.dhss.mo.gov/hsees.